

Job-Order, Operation, and Life-Cycle Costing Notes

Introduction

Costing systems are essential for accurately tracking and assigning costs to products or services. This document covers **Job-Order Costing**, **Operation Costing**, and **Life-Cycle Costing**, focusing on their applications, overhead allocation methods, and accounting treatments. These systems are critical for financial reporting, pricing decisions, and managerial decision-making, as outlined in the CMA (US) curriculum.

Job-Order Costing

Job-Order Costing is used when products or services are unique and identifiable, such as custom furniture, construction projects, or specialized consulting services. Costs are accumulated for each specific job, allowing for precise cost tracking.

- **Key Features:**
 - Direct materials and labor are traced directly to each job.
 - Manufacturing overhead is allocated using a predetermined rate.
 - Suitable for industries with customized or low-volume production.

Example: A custom furniture manufacturer builds a unique dining table (Job #123). Direct materials (wood, varnish) and direct labor (carpenter hours) are recorded specifically for Job #123, while overhead (factory rent, utilities) is allocated based on an allocation base, such as labor hours.

Operation Costing

Operation Costing is a hybrid of job-order and process costing, used when products share some common processes but also have unique characteristics. It is common in industries like apparel or electronics, where standardized processes are followed but products are customized.

- **Key Features:**
 - Direct materials are tracked by job (similar to job-order costing).
 - Conversion costs (labor and overhead) are allocated by process (similar to process costing).
 - Useful for batch production with some customization.

Example: A clothing manufacturer produces T-shirts in batches (standard cutting and sewing processes) but customizes them with different prints. Material costs are tracked per batch, while conversion costs are allocated across all units in the process.

Life-Cycle Costing

Life-Cycle Costing tracks all costs associated with a product from its design to disposal, including research, development, production, marketing, distribution, and post-sale support. It is primarily used for internal decision-making, such as pricing, product design, or sustainability analysis.

- **Cost Categories:**
 1. **Upstream Costs:** Research, development, and design.
 2. **Production Costs:** Manufacturing, labor, and overhead.
 3. **Downstream Costs:** Marketing, distribution, customer service, and disposal.
- **Customer Life-Cycle Costing:** Evaluates the total cost of ownership from the customer's perspective, including purchase price, maintenance, and operating costs.

Example: An automobile manufacturer uses life-cycle costing to assess the total cost of producing an electric vehicle, including battery development, manufacturing, and recycling costs, to determine a competitive selling price.

Overhead Allocation

Introduction to Overheads

Overhead costs are indirect costs not directly traceable to a specific product or job. They are classified into:

- **Manufacturing Overheads:** Costs necessary for production (e.g., factory rent, utilities, indirect materials, and labor).
- **Nonmanufacturing Overheads:** Period costs not tied to production (e.g., administrative salaries, marketing expenses), which may be expensed or allocated to production departments.

Types of Manufacturing Overheads:

- **Indirect Materials:** Supplies not part of the final product (e.g., cleaning supplies, disposable tools).
 - **Indirect Labor:** Wages for non-production staff (e.g., plant supervisors, janitors).
 - **General Overheads:** Factory-related costs (e.g., rent, utilities).
 - Overheads can be **fixed** (unchanging with production levels), **variable** (change with production volume), or **mixed** (combination of fixed and variable).
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Traditional Overhead Allocation Method

The traditional method allocates manufacturing overhead to products using a single **allocation base** (e.g., direct labor hours, machine hours, or number of components).

- **Steps:**
 1. Select an allocation base that reflects how overhead costs are incurred.
 2. Calculate a **predetermined overhead rate** at the start of the period.
 3. Apply the rate to units produced based on the actual or standard usage of the allocation base.

Formula for Predetermined Overhead Rate:

Predetermined Overhead Rate = Budgeted Manufacturing Overhead Costs / Budgeted Activity Level of Allocation Base

Example:

A company budgets \$500,000 in manufacturing overhead and expects 25,000 direct labor hours. The predetermined rate is:

$\$500,000 / 25,000 \text{ hours} = \$20 \text{ per direct labor hour}$

If a job uses 100 labor hours, the overhead allocated is:

$100 \text{ hours} \times \$20/\text{hour} = \$2,000$

Choosing the Allocation Base

The allocation base should reflect the production process:

- **Machine Hours:** Suitable for automated processes.
- **Direct Labor Hours:** Ideal for labor-intensive processes.
- **Number of Components:** Appropriate for products with varying complexity.

Companies may use multiple overhead pools with different bases for more accurate allocation, but the traditional method uses a single base per pool.

Determining the Activity Level

The activity level (denominator level) used to calculate the predetermined rate significantly impacts cost allocation:

1. **Expected Actual Capacity:** Based on forecasted demand for the budget period. Best for short-term performance measurement.

2. **Practical Capacity:** Theoretical capacity adjusted for downtime. Best for pricing decisions.
3. **Normal Capacity:** Average capacity over 2–3 years, accounting for seasonal and cyclical changes. Required for external reporting.
4. **Theoretical Capacity:** Maximum efficiency level, rarely used due to impracticality.

Impact of Activity Level:

- **Overestimation:** Leads to a low rate, underpricing products, and reduced profitability.
- **Underestimation:** Results in a high rate, overpricing products, and reduced sales volume.

Adjustments:

- **High Production:** Adjust fixed overhead rates downward to avoid overvaluing inventory.
- **Low Production:** Expense underapplied fixed overheads without adjusting the rate.
- **Variable Overhead:** Allocate based on actual usage, with adjustments for over/under application at period-end.

Accounting for Overhead

Overhead is recorded and applied as follows:

- **Actual Costs Incurred:**
 - Dr. Factory Overhead Control
 - Cr. Cash (or Accounts Payable)
- **Overhead Applied to Production:**
 - Dr. Work-in-Process Inventory
 - Cr. Factory Overhead Applied (or Control)

The **Factory Overhead Control** account tracks actual costs (debits), while the **Factory Overhead Applied** account records allocated costs (credits). The difference is **overapplied** (credit balance) or **underapplied** (debit balance) overhead.

Handling Variances:

- **Immaterial:** Close to Cost of Goods Sold.
- **Material:** Prorate among Work-in-Process, Finished Goods, and Cost of Goods Sold.
- **Rarely:** Restate all amounts using actual rates (complex and uncommon).

Cost Measurement Systems

Overhead allocation varies by costing system:

- **Standard Costing:** Uses a predetermined standard rate and standard allocation base allowed for actual production.
- **Normal Costing:** Uses an estimated normalized rate and actual allocation base used.
- **Extended Normal Costing:** Similar to normal costing but may incorporate additional factors.
- **Actual Costing:** Uses actual rates and actual allocation base, applied at period-end.

Example Problem: Job-Order Costing with Overhead Allocation

Scenario:

A furniture manufacturer uses job-order costing for custom chairs (Job #456). The company budgets \$600,000 in manufacturing overhead and 30,000 machine hours for the year. Job #456 uses 200 machine hours, \$5,000 in direct materials, and \$3,000 in direct labor. At year-end, actual overhead is \$620,000, and actual machine hours are 31,000.

Solution:

1. **Predetermined Overhead Rate:**
2. $\$600,000 / 30,000 \text{ hours} = \$20 \text{ per machine hour}$
3. **Overhead Allocated to Job #456:**
4. $200 \text{ hours} \times \$20/\text{hour} = \$4,000$
5. **Total Cost of Job #456:**
6. Direct Materials: \$5,000
7. Direct Labor: \$3,000
8. Overhead: \$4,000
9. Total Cost: \$12,000
10. **Over/Underapplied Overhead:**
 - Actual Overhead: \$620,000
 - Applied Overhead: $\$20 \times 31,000 \text{ hours} = \$620,000$
 - Variance: $\$620,000 - \$620,000 = \$0$ (no variance)

If actual overhead was \$630,000:

- Variance: $\$630,000 - \$620,000 = \$10,000$ underapplied
- **Immaterial:** Close to Cost of Goods Sold.
- **Material:** Prorate among WIP, Finished Goods, and Cost of Goods Sold based on their ending balances.

Business Application: If the manufacturer acquires a competitor, it must align overhead allocation methods across facilities to ensure consistent job costing in consolidated financial statements, adjusting for differences in production processes or overhead bases.

Summary

- **Job-Order Costing:** Tracks costs for unique products, allocating overhead using a predetermined rate.
- **Operation Costing:** Combines job-order and process costing for semi-standardized products.
- **Life-Cycle Costing:** Considers all costs from design to disposal for strategic decision-making.
- **Overhead Allocation:** Uses a predetermined rate based on an allocation base (e.g., labor hours, machine hours). Variances are resolved by closing to Cost of Goods Sold or prorating among inventory accounts.
- **Business Combinations:** Consolidated entities must standardize costing methods to ensure accurate financial reporting, adjusting for differences in overhead allocation or production processes.